

CLAIMS

What is claimed is:

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1. A method for making content available for users in a computer network, the content having an original location, the method including:
  - forwarding the content to one or more caches distributed throughout the computer network, each of said caches coupled to a switch or router;
  - storing the content in each of said one or more caches; and
  - storing a record identifying said content in each of said one or more caches, said record for any particular cache of said one or more caches having an original location field identifying the original location of said content, a distance field indicating a distance from said particular cache to the original location of said content, and a field indicating a version number of said content.
2. The method of claim 1, wherein said original location of said content includes a hypertext transfer protocol uniform resource locator.
3. The method of claim 1, wherein said record further includes a field indicating an IP address for a web server hosting said content.

4. The method of claim 3, wherein said field indicating an IP address further indicates a port number.

5 5. The method of claim 1, wherein said record further includes a field indicating a date and time of the last update to the record.

26 6. The method of claim 1, wherein said record further includes a field having a billing token or certificate for content peering between providers.

0 7. The method of claim 1, wherein said record further includes a tag field indicating a Quality of Service process to be applied when a user attempts to access the content.

5 8. The method of claim 1, wherein said record further includes a cache bypass field indicating whether said content need not be stored in said particular cache.

9. The method of claim 1, wherein said record further includes a server load balancing field indicating a server load balancing process to be applied when a user attempts to access the content.

20 10. A method for making content available for users in a computer network, the content having an original location, the method including:

receiving the content forwarded from the original location;

storing the content in a cache coupled to a switch or router; and

storing a record identifying the content in said cache, said record having an original location field identifying the original location of said content, a distance field indicating a distance from said cache to the original location of said content, and a field  
5 indicating a version number of said content.

11. The method of claim 10, wherein said original location of said content includes a  
hypertext transfer protocol uniform resource locator.

12. The method of claim 10, wherein said record further includes a field indicating an  
IP address for a web server hosting said content.

13. The method of claim 12, wherein said field indicating an IP address further  
indicates a port number.

14. The method of claim 10, wherein said record further includes a field indicating a  
date and time of the last update to the record.

15. The method of claim 10, wherein said record further includes a field having a  
20 billing token or certificate for content peering between providers.

16. The method of claim 10, wherein said record further includes a tag field indicating a Quality of Service process to be applied when a user attempts to access the content.

17. The method of claim 10, wherein said record further includes a cache bypass field indicating whether said content need not be stored in said cache.

18. The method of claim 10, wherein said record further includes a server load balancing field indicating a server load balancing process to be applied when a user attempts to access the content.

19. A method for updating content in a computer network, the content located at a web server and having an original location, the method including:

creating a routing table entry for the content in a cache, said routing table entry having a record with a location field with the original location of said content, a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content; and

forwarding said routing table entry to another of one or more caches in the computer network to allow said another of one or more caches to create a routing table entry for the content.

20. The method of claim 19, wherein said field with the original location of the content includes a hypertext transfer protocol uniform resource locator.

21. The method of claim 19, wherein said record further includes a field indicating an IP address for the web server.

5 22. The method of claim 21, wherein said field indicating the IP address further indicates a port number.

Ab 23. The method of claim 19, wherein said record further includes a field indicating the date and time of the last update to the record.

0 24. The method of claim 19, wherein said record further includes a field having a billing token or certificate for content peering between providers.

15 25. The method of claim 19, wherein said record further includes a tag field indicating a Quality of Service process to be applied when a user attempts to access the content.

26. The method of claim 19, wherein said record further includes a cache bypass field indicating whether said content need not be stored in said cache.

20 27. The method of claim 19, wherein said record further includes a server load balancing field indicating a server load balancing process to be applied when a user attempts to access the content.

28. The method of claim 19, further including:

determining if a record corresponding to an older version of said content is already stored in said cache; and

retrieving the content from said original location and storing it in said cache if a record corresponding to an older version of said content is already stored in said cache.

29. The method of claim 20, wherein said determining include examining said version number field of said record and comparing it with version number fields in records with identical location fields.

30. The method of claim 19, further including:

detecting the alteration of the content with a server load balancer through polling of the web server.

31. The method of claim 19, further including:

notifying a server load balancer that the content has been altered.

32. A method for handling a request for content from a user in a computer network, including:

receiving the request at a switch or router;

examining an original location address in a header in the request;

comparing said original location address with one or more entries in a table in a cache coupled to said switch or router, if said cache exists;

forwarding the content from said cache to said user if an entry in said table in said cache has an original location field identical to said original location address; and

5 transferring said request to another switch or router if said cache does not exist or said cache does not have an entry in said table with an original location field identical to said original location address.

33. The method of claim 32, wherein said transferring includes transferring said request to the next switch or router along a path ending with a web server hosting the content.

34. The method of claim 32, wherein said request is in the form of a SYN packet with said original address located in a header in a payload field of the SYN packet.

35. The method of claim 34, establishes a TCP/IP session between itself and the user if an entry in said table in said cache has an original location field identical to said original location address.

20 36. An apparatus for making content available for users in a computer network, the content having an original location, the apparatus including:

a content forwarder coupled to a server load balancer;

a switch or router coupled to said content forwarder via the computer network;  
 a cache coupled to said switch or router;  
 a content storer coupled to said cache and coupled to said switch or router; and  
 a record storer coupled to said cache and coupled to said switch or router.

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37. An apparatus for updating content in a computer network, the content located at a web server and having an original location, the apparatus including:

a cache;  
 a routing table entry creator coupled to said cache; and  
 a routing table entry forwarder coupled to said cache and to said routing table entry creator.

38. The apparatus of claim 37, further including:

a record version determiner coupled to said cache; and  
 a content retriever coupled to said record version determiner.

39. The apparatus of claim 37, further including a cache-to-original-location distance recomputer coupled to said routing table entry creator.

40. An apparatus for handling a request for content from a user in a computer network, including:

a request receiver;



a cache;

an original location address examiner coupled to said request receiver and to said cache;

an original location address comparator coupled to said original location address examiner and to said cache receiving the request at a switch or router;

a content forwarder coupled to said original location address comparator and to said cache; and

a request transferer coupled to said request receiver and to said original location address comparator.

41. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine for making content available for users in a computer network, the content having an original location, the method including:

forwarding the content to one or more caches distributed throughout the computer network, each of said caches coupled to a switch or router;

storing the content in each of said one or more caches; and

storing a record identifying said content in each of said one or more caches, said record for any particular cache of said one or more caches having an original location field identifying the original location of said content, a distance field indicating a distance from said particular cache to the original location of said content, and a field indicating a version number of said content.

42. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine for making content available for users in a computer network, the content having an original location, the method including:

receiving the content forwarded from the original location;

5 storing the content in a cache coupled to a switch or router; and

storing a record identifying the content in said cache, said record having an original location field identifying the original location of said content, a distance field indicating a distance from said cache to the original location of said content, and a field indicating a version number of said content.

43. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine for updating content in a computer network, the content located at a web server and having an original location, the method including:

creating a routing table entry for the content in a cache, said routing table entry having a record with a location field with the original location of said content, a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content;

forwarding said routing table entry to another of one or more caches in the computer network; and

20 repeating said creating and forwarding for each of said one or more caches.

44. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine for updating content in a computer network, the content located at a web server and having an original location, the method including:

creating a routing table entry for the content in a cache, said routing table entry

5 having a record with a location field with the original location of said content, a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content; and

7A6 forwarding said routing table entry to another of one or more caches in the computer network to allow said another of one or more caches to create a routing table entry for the content.

45. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine for handling a request for content from a user in a computer network, the method including:

5 receiving the request at a switch or router;

examining an original location address in a header in the request;

comparing said original location address with one or more entries in a table in a cache coupled to said switch or router, if said cache exists;

15 forwarding the content from said cache to said user if an entry in said table in said  
20 cache has an original location field identical to said original location address; and

transferring said request to another switch or router if said cache does not exist or said cache does not have an entry in said table with an original location field identical to said original location address.

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46. An apparatus for making content available for users in a computer network, the content having an original location, the apparatus including:

a memory;

a network interface coupled to said memory;

a processor coupled to said memory programmed to perform the steps of:

forwarding the content to one or more caches distributed throughout the computer network, each of said caches coupled to a switch or router;

storing the content in each of said one or more caches; and

storing a record identifying said content in each of said one or more caches, said record for any particular cache of said one or more caches having an original location field identifying the original location of said content, a distance field indicating a distance from said particular cache to the original location of said content, and a field indicating a version number of said content.

20 47. An apparatus for making content available for users in a computer network, the content having an original location, the apparatus including:

a memory;

a network interface coupled to said memory;

a processor coupled to said memory programmed to perform the steps of:

receiving the content forwarded from the original location;

storing the content in a cache coupled to a switch or router; and

5 storing a record identifying the content in said cache, said record having an original location field identifying the original location of said content, a distance field indicating a distance from said cache to the original location of said content, and a field indicating a version number of said content.

48. An apparatus for updating content in a computer network, the content located at a web server and having an original location, the apparatus including:

a memory;

a network interface coupled to said memory;

a processor coupled to said memory programmed to perform the steps of:

5 creating a routing table entry for the content in a cache, said routing table entry having a record with a location field with the original location of said content, a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content;

20 forwarding said routing table entry to another of one or more caches in the computer network; and

repeating said creating and forwarding for each of said one or more caches.

49. An apparatus for updating content in a computer network, the content located at a web server and having an original location, the apparatus including:

a memory;

5 a network interface coupled to said memory;

a processor coupled to said memory programmed to perform the steps of:

creating a routing table entry for the content in a cache, said routing table entry having a record with a location field with the original location of said content, a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content; and

forwarding said routing table entry to another of one or more caches in the computer network to allow said another of one or more caches to create a routing table entry for the content.

50. An apparatus for handling a request for content from a user in a computer network, including:

a memory;

a network interface coupled to said memory;

20 a processor coupled to said memory programmed to perform the steps of:

receiving the request at a switch or router;

examining an original location address in a header in the request;

comparing said original location address with one or more entries in a table in a cache coupled to said switch or router, if said cache exists;

forwarding the content from said cache to said user if an entry in said table in said cache has an original location field identical to said original location address; and

transferring said request to another switch or router if said cache does not exist or said cache does not have an entry in said table with an original location field identical to said original location address.

51. An apparatus for making content available for users in a computer network, the content having an original location, the apparatus including:

means for forwarding the content to one or more caches distributed throughout the computer network, each of said caches coupled to a switch or router;

means for storing the content in each of said one or more caches; and

means for storing a record identifying said content in each of said one or more caches, said record for any particular cache of said one or more caches having an original location field identifying the original location of said content, a distance field indicating a distance from said particular cache to the original location of said content, and a field indicating a version number of said content.

52. An apparatus for making content available for users in a computer network, the content having an original location, the apparatus including:

means for receiving the content forwarded from the original location;

means for storing the content in a cache coupled to a switch or router; and

means for storing a record identifying the content in said cache, said record having an original location field identifying the original location of said content, a distance field  
 5 indicating a distance from said cache to the original location of said content, and a field indicating a version number of said content.

53. An apparatus for updating content in a computer network, the content located at a web server and having an original location, the apparatus including:

means for creating a routing table entry for the content in a cache, said routing  
 10 table entry having a record with a location field with the original location of said content, a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content;

means for forwarding said routing table entry to another of one or more caches in  
 15 the computer network; and

means for repeating said creating and forwarding for each of said one or more  
 caches.

54. An apparatus for updating content in a computer network, the content located at a  
 20 web server and having an original location, the apparatus including:

means for creating a routing table entry for the content in a cache, said routing  
 table entry having a record with a location field with the original location of said content,



a distance field indicating the distance from said cache to the original location of said content, and a version number field indicating a version number of said content; and

means for forwarding said routing table entry to another of one or more caches in the computer network to allow said another of one or more caches to create a routing table entry for the content.

55. An apparatus for handling a request for content from a user in a computer network, including:

means for receiving the request at a switch or router;

means for examining an original location address in a header in the request;

means for comparing said original location address with one or more entries in a table in a cache coupled to said switch or router, if said cache exists;

means for forwarding the content from said cache to said user if an entry in said table in said cache has an original location field identical to said original location address;

and

means for transferring said request to another switch or router if said cache does not exist or said cache does not have an entry in said table with an original location field identical to said original location address.